

What is claimed is:

1. A system for measuring, dispensing and pneumatically delivering micro-ingredients to a feed ration comprising:
  - a weigh hopper;
  - a storage bin including an auger mounted thereto, said auger for metering a desired amount of a micro-ingredient into said weigh hopper;
  - 5 a scale mounted to said weigh hopper for determining the weight of the micro-ingredient metered into said weigh hopper from said auger, said auger being activated to meter the desired amount of the micro-ingredient based upon weight indicated by said scale;
  - a transport line for delivering the micro-ingredient to the feed ration;
  - 10 means intermediate said weigh hopper and said transport line for introducing the micro-ingredient in the transport line;
  - an eductor mounted in line with said transport line; and
  - means for supplying pressurized air through said eductor and through said transport line, wherein said eductor facilitates movement of the micro-ingredient through said means
  - 15 for introducing and through said eductor into said transport line.

2. A system, as claimed in Claim 1, wherein:
  - said bin includes a plurality of bins each having a corresponding auger for metering separate micro-ingredients into said weight hopper.

3. A system, as claimed in Claim 1, wherein:

said weigh hopper includes a plurality of weigh hoppers;

said bin includes a plurality of bins each having a corresponding auger for metering separate micro-ingredients from each of said bins into corresponding weigh hoppers of said plurality of weigh hoppers; and

said means for introducing includes a plurality of means for introducing enabling the separate micro-ingredients to be introduced into the transport line.

4. A system, as claimed in Claim 3, wherein:

said scale includes a plurality of scales, one scale of said plurality of scales being mounted to each weigh hopper of said plurality of weigh hoppers for separately determining the weight of micro-ingredients in each of said weigh hoppers.

5. A system, as claimed in Claim 3, wherein:

said transport line includes a plurality of transport lines for separately conveying the micro-ingredients, said means for supplying pressurized air communicating with each of said plurality of transport lines thereby causing transport of the micro-ingredients through the plurality of transport lines.

6. A system, as claimed in Claim 5, wherein:  
said means for supplying pressurized air includes a plurality of means for supplying  
pressurized air so that each transport line of said plurality of transport lines has a dedicated  
means for supplying pressurized air therethrough.

7. A system, as claimed in Claim 1, further including:  
a discharge device attached to a discharge end of said transport line, said discharge  
device providing a curtain of liquid surrounding said micro-ingredient as said ingredient exits  
the discharge end of said transport line.

8. A system, as claimed in Claim 1, further including:  
a mixing manifold connected to a discharge end of said transport line for mixing a  
stream of liquid and the micro-ingredient passing therethrough.

9. A system, as claimed in Claim 8, wherein:  
said mixing manifold includes a plurality of inlet ports which receive the micro-  
ingredient and the liquid therethrough, said manifold providing a common passageway for  
mixing of the liquid and the micro-ingredient after passing through the ports.

10. A method of measuring, dispensing, and pneumatically delivering micro-  
ingredients to a feed ration, said method comprising the steps of:  
providing a bin for storing a quantity of a micro-ingredient;  
metering the micro-ingredient from the bin to a weigh hopper;  
5 weighing the micro-ingredient in the weight hopper;  
providing a transport line and an eductor placed in line with transport line;  
pressurizing the transport line and eductor by a source of pressurized air;  
operating the eductor to draw the micro-ingredient from the weigh hopper and into  
the transport line; and  
10 pneumatically transferring the micro-ingredient to the feed ration without the addition  
of liquid to the micro-ingredient while the micro-ingredient is in the transport line, bin and  
hopper.
11. A method, as claimed in Claim 10, further comprising the steps of:  
providing a discharge device at a discharge end of the transport line; and  
providing a flow of liquid through the device creating a curtain of liquid surrounding  
the micro-ingredient as the micro-ingredient exits a discharge end of the discharge device.
12. A method, as claimed in Claim 10, further comprising the steps of:  
providing a mixing device at a discharge end of the transport line; and  
introducing a flow of liquid through the mixing device simultaneous with flow of the  
micro-ingredient thereby resulting in a slurry mixture of the micro-ingredient and liquid.

13. A method, as claimed in Claim 10 wherein:

said storage bin includes a plurality of bins and said weigh hopper includes a plurality of weigh hoppers wherein separate micro-ingredients are stored in each bin, and each micro-ingredient is metered to a corresponding weigh hopper, each weigh hopper weighing the  
5 micro-ingredient therein prior to transfer of the micro-ingredient to the transport line.

14. A method, as claimed in Claim 10, wherein:

said weighing step is achieved by measuring the gain of weight by addition of the micro-ingredient to the weigh hopper.

15. A method of measuring, dispensing, and pneumatically delivering micro-ingredients to a feed ration, said method comprising the steps of:

providing a storage bin for storing a quantity of a micro-ingredient;

metering the micro-ingredient from the bin to a means for temporarily storing the

5 metered micro-ingredient;

recording the loss of weight in the bin after the micro-ingredient has been metered to the means for storing, the recorded loss of weight corresponding to the amount of the micro-ingredient metered to the means for storing;

providing a transport line and an eductor mounted in line with the transport line;

10 pressurizing the transport line and eductor by a source of pressurized air;

operating the eductor to draw the micro-ingredient from the means for storing into the transport line; and

pneumatically transferring the micro-ingredient to the feed ration, said transferring step being achieved without the addition of liquid in the transport line, bin, and hopper.

16. A method, as claimed in Claim 15, further comprising the steps of:

providing a discharge device at a discharge end of the transport line; and

providing a flow of liquid through the device creating a curtain of liquid surrounding the micro-ingredient as the micro-ingredient exits a discharge end of the discharge device.

17. A method, as claimed in Claim 15, further comprising the steps of:  
providing a mixing device at a discharge end of the transport line; and  
introducing a flow of liquid through the mixing device simultaneous with the flow  
of the micro-ingredient thereby resulting in a slurry mixture of the micro-ingredient and  
5 liquid.

18. A method, as claimed in Claim 15, wherein:  
said storage bin includes a plurality of bins and said means for temporarily storing  
includes a plurality of means for temporarily storing wherein separate micro-ingredients are  
stored in each storage bin, and each micro-ingredient is metered into a corresponding means  
5 for temporarily storing.

19. A method of measuring, dispensing, and pneumatically delivering micro-  
ingredients to a feed ration, said method comprising the steps of:

- providing a storage bin for storing a quantity of a micro-ingredient;
- metering the micro-ingredient from the bin to a means for temporarily storing the  
5 metered micro-ingredient, said metering step resulting in delivery of a predetermined and  
desired quantity of the micro-ingredient to the means for storing;
- providing a transport line and an eductor mounted in line with the transport line;
- pressurizing the transport line and eductor by a source of pressurized air;
- operating the eductor to draw the micro-ingredient from the means for storing into  
10 the transport line; and
- pneumatically transferring the micro-ingredient to the feed ration, without addition  
of liquid to the micro-ingredient while the micro-ingredient is in the bin, hopper and  
transport line.

20. A method, as claimed in Claim 19, further comprising the steps of:  
providing a discharge device at a discharge end of the transport line; and  
providing a flow of liquid through the device creating a curtain of liquid surrounding  
the micro-ingredient as the micro-ingredient exits a discharge end of the discharge device.

21. A method, as claimed in Claim 19, further comprising the steps of:  
providing a mixing device at a discharge end of the transport line; and

introducing a flow of liquid through the mixing device simultaneous with the flow  
of the micro-ingredient thereby resulting in a slurry mixture of the micro-ingredient and  
5 liquid.

22. A method, as claimed in Claim 19, wherein:

said storage bin includes a plurality of bins and said means for temporarily storing  
includes a plurality of means for temporarily storing wherein separate micro-ingredients are  
stored in each storage bin, and each micro-ingredient is metered into a corresponding means  
5 for temporarily storing.